HIGH-AFFINITY MOUSE MONOCLONAL ANTIBODIES TO GPC-3 FOR LIVER CANCER RESEARCH

SUMMARY

The National Cancer Institute Laboratory of Molecular Biology seeks parties to license or co-develop and commercialize antibody drug/toxin conjugates as liver cancer therapy and diagnostics.

REFERENCE NUMBER

E-136-2012

PRODUCT TYPE

- Diagnostics
- Research Materials
- Therapeutics

KEYWORDS

- liver
- hepatocellular carcinoma
- HCC
- Glypican-3
- GPC3
- antibody
- monoclonal
- glycoprotein

COLLABORATION OPPORTUNITY

This invention is available for licensing and co-development.

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DESCRIPTION OF TECHNOLOGY

The National Cancer Institute Laboratory of Molecular Biology seeks parties for collaborative research to co-develop and commercialize antibody drug/toxin conjugates as liver cancer therapy and diagnostics.

There is great interest and value in developing more sensitive and efficient agents for earlier detection of hepatocellular cancer (HCC). Glypican-3 (GPC3) is a cell surface heparin sulfate glycoprotein that is

expressed on the vast majority of HCC cells. The correlation between GPC3 expression and HCC makes GPC3 an attractive candidate for studying the disease progression and treatment of HCC. The presence, progression, and treatment of HCC can potentially be monitored by tracking the level of GPC3 expression on cells. This can be accomplished using GPC3-specific monoclonal antibodies such as those NCI researchers generated for the cell surface domain of GPC3 (YP6, YP7, YP8, YP9 and YP9.1).

POTENTIAL COMMERCIAL APPLICATIONS

- Treatment of HCC as a stand-alone antibody, or as an antibody-drug conjugate (immunotoxin)
- Detection of cells that express GPC3 for monitoring HCC disease progression and treatment
- Immunostaining for tumor imaging, or ELISA and immunohistochemistry applications
- Other antibody-related research use, including immunoprecipitation, Western blot analysis, etc.

COMPETITIVE ADVANTAGES

- Sub-nanomolar levels of binding affinity compared to commercially available GPC3 antibodies such as 1G12
- Able to bind to wild-type GPC3 better than the GPC3 core protein that lacks heparin sulfate

INVENTOR(S)

- Mitchell Ho (NCI)

DEVELOPMENT STAGE

- Pre-clinical (in vivo)

PUBLICATIONS

1. Phung Y, et al. [PMID: 22820551]
2. Ho M. [PMID 21942912]
3. Ho M. and Kim H. [PMID 21112773]

PATENT STATUS

- **U.S. Issued:** US Patent 9,409,994 issued 9 Aug. 2016
- **Foreign Filed:** Filing in China (Application No. 201380039993.7 filed May 31, 2013), Japan, Korea, and Singapore

RELATED TECHNOLOGIES

- E-130-2011 - Single-domain GPC-3 Monoclonal Antibodies for the Treatment of Hepatocellular Carcinoma

THERAPEUTIC AREA

- Cancer/Neoplasm